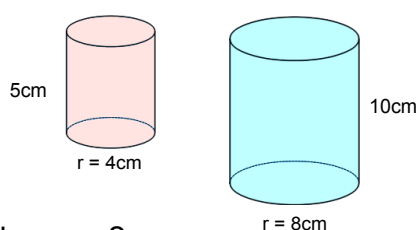


Areas and Volumes of Similar Solids

Similar solids--same shape, but not necessarily the same size

All spheres are similar.

For other solids:
Bases must be similar and other corresponding lengths must be proportional.



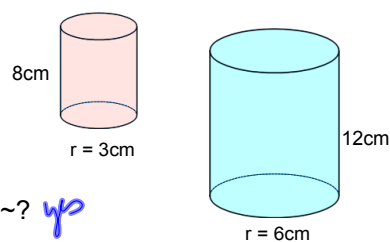
ex 1:

Are the bases ~? *yes*

Scale factor? *1:2*

Are other lengths proportional?

yes



ex 2:

Are the bases ~? *yo*

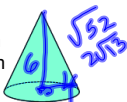
Scale factor? *1:2*

Are other lengths proportional?

$$\frac{8}{12} \neq \frac{1}{2}$$

Not ~ solids

ex 3: $r = 4\text{cm}$
 $h = 6\text{cm}$

Are bases ~? 

Heights ~?

Scale Factor? $2:3$

Find the following for each figure and compare the ratios to scale factor.

	small	large	ratio
l	$2\sqrt{13}$	$3\sqrt{13}$	$2:3$
C	8π	12π	$2:3$
B	16π	36π	$4:9$
LA	$8\sqrt{13}\pi$	$18\sqrt{13}\pi$	$4:9$
TA	32π	108π	$8:27$
V	32π	108π	$8:27$

Theorem 13.1--If the scale factor of 2 ~ solids is $a:b$, then:

1. The ratio of corresponding perimeters is $a:b$

2. The ratio of corresponding areas is $a^2:b^2$

3. The ratio of corresponding volumes is $a^3:b^3$

Ex:

The scale factor of 2 cones is $5:6$.

What is the ratio of:

P $5:6$

LA $25:36$

TA $125:216$

V $125:216$

l $5:6$

r $5:6$

If the LA of smaller is 100π ,
 what is LA for the larger?

$$\frac{25}{36} = \frac{100\pi}{x} \quad 144\pi$$

If the V of smaller is 86.4π ,
 what is V for the larger?

$$\frac{125}{216} = \frac{86.4\pi}{V} \quad 149.3\pi$$

Ex:

Two solid metal cylinders are similar.

radius of 1st = 10cm

radius of 2nd = 14cm

What is the scale factor? $5:7$

If the smaller cylinder weighs 2.5 kg ,
 how much does the larger one weigh?

$$\frac{125}{343} = \frac{2.5}{x} \quad 6.86\text{ kg}$$

Ex:

Two similar pyramids have LA = 12cm^2 and LA = 27cm^2 .

$$\frac{12}{27} = \frac{4}{9} \text{ Ratio of Areas}$$

What is the scale factor?

$$\sqrt{4} : \sqrt{9}$$

$$2 : 3$$

If the volume of the smaller is $V = 20\text{cm}^3$, what is the volume for the larger?

$$\frac{2^3}{3^3} \cdot \frac{8}{27} = \frac{20}{V} \quad (67.5\text{cm}^3)$$

Ex:

Two similar prisms have LA = 27cm^2 and LA = 75cm^2 .What is the scale factor? $3:5$ If the volume of the smaller is $V = 121.5\text{cm}^3$, what is the volume for the larger?

$$\frac{27}{125} = \frac{121.5}{V}$$

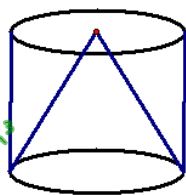
$$(567.5\text{cm}^3)$$

Is this cylinder ~ to the cone? No Cylinder
Cone

Volume = $36\pi \text{ u}^3$

Volume = ?

$$12\pi \text{ u}^3$$



$$V = Bh$$

$$V = \frac{1}{3}Bh$$

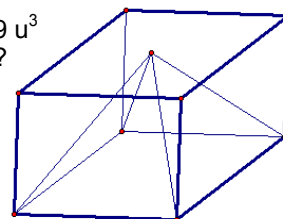
Pyramid
Prism

Volume = 9 u^3

Volume = ?

$$\times 3$$

$$27 \text{ u}^3$$



HW

p710-712

3-10, 27-31